WATER BRIEF

CURBING ASIA'S NONREVENUE WATER

Utilities in Asia particularly have every reason to worry about water losses— they lose up to 65% of their production daily, with most utilities averaging a 30% loss.

This bane of every water utility's existence is called nonrevenue water. And water loss is literally money down the drain. Governments and utilities mistakenly try to cover the losses by increasing production, developing new freshwater sources, building treatment plants, and even constructing dams.

None of these investments solve the problem—they just make the problem worse by feeding more water into a wasteful system. Those investments could have been put to better use rehabilitating the faulty piped system constructing new systems, or addressing inadequate maintenance, metering or collection processes.

Nonrevenue Water Defined

Nonrevenue water (NRW) is water that does not bring revenue for the utility as it should. There are three reasons for this:

- water is distributed but never arrives at the tap because of leaks, bursts, or overflows
- water is used without the utility's consent, mainly through theft and illegal connections, or improper metering
- water used for free with the utility's permission, e.g. free water distributed at standpipes or used for cleaning reservoirs or fighting fires.

ADB photo library (3X)

Water Losses on the Rise

While water loss is inherent in any water distribution system, some of its components are more easily solved than others. Most leaks can be managed readily through repair and rehabilitation. In fact, expensive and sophisticated leak detection technology is not even always necessary. On-the-ground experience in Asia reveals that going out in the field and repairing all visible leaks already reduces NRW levels significantly.

But illegal connections, water theft, inaccurate metering, and inefficient billing systems pose greater challenges. Roughly 50–65% of Asia's water losses result from these factors. In many instances, utility personnel themselves are installing the illegal connections and collecting the fees that should be going to the utility accounts, which are sorely in need of funds to maintain service delivery.

Adding to the problem is the incomplete metering of connections. An ADB study of 18 Asian utilities revealed that only 76.5% of connections are metered. As most of these meters are not replaced or calibrated regularly, causing metering inaccuracies, it is possible that properly metered water is even less than 76.5%.

These problems affect the water utilities' ability to increase connections and expand service coverage. But worrying about NRW should not be the monopoly of water utilities. Consumers should worry as much; they are the first to suffer when the utilities cannot serve them because much needed water has gone down the drain before it was ever put to good use.

Facing the NRW Challenge

The key to developing a strategy for managing NRW is to understand the reasons for its existence and the factors that contribute to its rise. Techniques and procedures can then be customized to address these factors.

Asian Development Bank ADB

When Ek Sonn Chan, General Director of Cambodia's Phnom Penh Water Supply Authority, first took the reigns of the utility in 1993, he discovered that only 20% of the utility's connections were metered, and utility employees themselves were installing most of the illegal connections. His initial interventions included installing water meters, firing staff found guilty of corrupt practices, partnering with the public to report illegal connections, leaks and other service problems, and providing incentives for staff to do the job right. From 72% in 1993, the utility's NRW has now gone down to 6%, a remarkable feat not just in Asia but globally.

Reducing Asia's NRW is essentially a governance challenge. Illegal connections can only be eliminated when utilities have autonomy and discipline, and when they are accountable to regulators and the public. In addition, utility employees need genuine incentives to do their jobs and replace the incentives they have made for themselves through illegal connections, false meter readings, and others.

Getting the public to value the tariff they pay for their water is also a solid step toward addressing the NRW challenge. When tariffs are valued as they should, people develop a stronger incentive to report to utilities the leaks, thefts, and other water losses they observe within their environment.

Benchmarking NRW is also particularly useful, as it enables utilities to compare themselves with others, or compare their individual performances at different periods. In 2005, the South East Asian Water Utilities Network concluded the first phase of a regional benchmarking program that included NRW reduction as a key indicator. The network is now in the 2nd phase of its benchmarking program involving 40 water utilities, with results to be finalized in 2007.

Water Lost, Water Regained

Phnom Penh's is not the only water utility finding its stride in the fight against NRW.

Manila Water Company, Inc., a concessionaire that took over an inefficient water network system in 1997, faced deteriorated pipes lines, widespread illegal connections, and a 63% NRW. With a multi-pronged strategy that involved strategic zoning, gaining the public's trust, and technological innovations, Manila Water not only reduced NRW to 30% by 2006, but has also increased its customer base, including 148,000 urban poor households.

In Ho Chi Minh, a pilot study in two districts that lose massive amounts of water and revenues found 126 leaks in just a 10-kilometer stretch of pipes and uncovered metering and connection anomalies. By readjusting water pressure to minimize the leaks and updating its customer database to identify thieves, the city's utility reduced NRW from 42% to 31% in less than a year, saving $1.4 million in annual losses.

These utilities have begun to realize one truth—once a utility invests its time and resources in curbing NRW, improvements in revenues and service delivery are bound to happen.

More success stories on developing Asia's triumph over NRW can be found at ADB's water website: www.adb.org/water.

What is nonrevenue water?

In its "Best Practice" Water Balance and Terminology, the International Water Association (IWA) defined the various components of nonrevenue water as follows:

"IWA Best Practice" Water Balance and Terminology

System Input Volume	Authorized Consumption	Billed Authorized Consumption	• Billed, metered consumption (including water exported) • Billed, non-metered consumption	Revenue Water
		Unbilled Authorized Consumption	• Unbilled, metered consumption • Unbilled, non-metered consumption	Non-revenue Water
	Water Losses	Apparent Losses	• Unauthorized consumption • Metering inaccuracies	
		Real Losses	• Leakage on transmission and distribution mains • Leakage and overflows at utility's storage tanks • Leakage on service connections up to customers' meters	